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FEDERAL - STATE - PRIVATE COOPERATIVE

SNOW SURVEY and WATER SUPPLY FORECASTS for MONTANA & NORTHERN WYOMING

UNITED STATES DEPARTMENT of AGRICULTURE···SOIL CONSERVATION SERVICE,
and
MONTANA AGRICULTURAL EXPERIMENT STATION

In cooperation with the U.S. Forest Service, U.S. Geological Survey, National Park Service, U.S. Bureau of Reclamation, State Engineers of Montana and Wyoming and other Federal, State and private organizations.

AS OF
MAR. 1, 1958

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UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

TO RECIPIENTS OF COOPERATIVE SNOW SURVEY AND WATER SUPPLY FORECAST REPORTS:

The climate of the cultivated and populated areas of the West is characterized by relatively dry summer months. Such precipitation as occurs falls mostly in the winter and early spring months when it is of little immediate benefit to growing crops. Fortunately, most of this precipitation falls as mountain snow which stays on the ground for months, melting later to sustain streamflow during the period of greatest demand during late spring and summer. Thus, nature provides in mountain snow an imposing water storage facility.

The amount of water stored in mountain snow varies from place to place as well as from year to year and accordingly, so does the runoff of the streams. The best seasonal management of variable western water supplies results from fore-knowledge of the runoff.

A snow survey consists of a series of about ten samples taken with specially designed snow sampling equipment along a permanently marked line, about 1000 feet in length, called a snow course. The use of snow sampling equipment provides snow depth and water equivalent values for each sampling point. The average of these values is reported as the snow survey measurement for a snow course.

Snow surveys are made monthly or semi-monthly beginning in January or February and continue through the snow season until April, May or June. Currently more than 1300 western snow courses are measured each year. These measurements furnish the key data for water supply forecasts.

By relating snow survey measurements taken over a period of years to spring-summer runoff during the same period, relationships have been developed which make it possible to forecast seasonal runoff several months in advance of occurrence. In order to make a forecast, once a forecast relationship has been developed, the maximum snow water content at previously selected key snow courses is usually entered in the forecast relationship. More accurate forecasts are often obtained when other factors such as soil moisture, base flow and spring precipitation are considered and included in the forecast relationships.

Listed below are the Federal-State-Private Cooperative Snow Survey and Water Supply Forecast reports available for the West which contain detailed information on snow survey measurements, streamflow forecasts, reservoir storage, soil moisture and other guide data to water management and conservation decisions.

PUBLISHED BY SOIL CONSERVATION SERVICE

REPORTS	ISSUED	COOPERATING WITH	LOCATION
RIVER BASINS			
COLORADO, RIO GRANDE AND PLATTE-ARKANSAS	MONTHLY (FEB.-MAY)	COLO. EXP. STATION	FT. COLLINS, COLO.
COLUMBIA *Includes Alaska*	MONTHLY (JAN.-MAY)		BOISE, IDAHO
UPPER MISSOURI	MONTHLY (FEB.-MAY)	MONT.AGR.EXP.STATION	BOZEMAN, MONTANA
WEST-WIDE	SEMI-ANNUALLY (OCT. 1 AND APR.1)	COOPERATORS	PORTLAND, OREGON
STATES			
ARIZONA	SEMI-MONTHLY (JAN. 15-APR.1)	SALT R. VALLEY WATER USERS ASSOCIATION	PHOENIX, ARIZONA
NEVADA	MONTHLY (FEB.-APR.)	NEVADA STATE ENGINEER	RENO, NEVADA
OREGON	MONTHLY (JAN.-MAY)	ORE.AGR.EXP.STATION	PORTLAND, OREGON
UTAH	MONTHLY (JAN.-MAY)	UTAH STATE ENGINEER UTAH AGR.EXP.STATION	SALT LAKE CITY, UTAH
WASHINGTON	MONTHLY (FEB.-MAY)	WASH. STATE DEPT. OF CONSERVATION AND DEVELOPMENT	SPOKANE, WASHINGTON
WYOMING	MONTHLY (FEB.-JUNE)	WYOMING STATE ENGINEER	CASPER, WYOMING

Copies of the various reports may be secured from: Head, Water Supply Forecasting Section
Soil Conservation Service
209 S.W. 5th Avenue, Portland 4, Oregon

PUBLISHED BY OTHER AGENCIES

OTHER SNOW SURVEY REPORTS			
BRITISH COLUMBIA	MONTHLY (FEB.-JUNE)	COMPTROLLER, WATER RIGHTS BR., DEPT. OF LANDS AND FORESTS, PARLIAMENT BLDGS.	VICTORIA, B.C.
CALIFORNIA	MONTHLY (FEB.-MAY)	CALIFORNIA DEPARTMENT OF WATER RESOURCES.	SACRAMENTO, CALIFORNIA

FEDERAL - STATE COOPERATIVE

SNOW SURVEYS and WATER SUPPLY FORECASTS

for

MONTANA AND NORTHERN WYOMING

(Upper Missouri and Upper Columbia River Basins)

Report Prepared by:

A. R. Codd
Hydraulic Engineer
Soil Conservation Service

Soil Conservation Service
U. S. Department of Agriculture
and
Montana Agricultural Experiment Station
Bozeman, Montana

Report issued by:

H. D. Hurd
State Conservationist
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Montana Agricultural
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M. M. Kelso, Director
Montana Agricultural
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WATER SUPPLY OUTLOOK
FOR THE STATE OF MONTANA
as of
MARCH 1, 1958

The water supply for the Upper Missouri Basin in Montana is 81 percent average and 91 percent of 1957.

The water supply for the Columbia Basin in Montana averages 97 percent normal. The snow-pack is 4 percent larger than last season.

In all basins, soil under the snow is damp, wet and unfrozen.

Reservoir Storage is slightly below average for March first.

MISSOURI RIVER

JEFFERSON RIVER BASIN:

The 1958 snow-pack, as measured for March first, is 84 percent average and 94 percent of last year. As indicated by the March first Surveys, the southern portion of the Beaverhead Soil Conservation District will have about 10 percent less water than last season. The March snow-pack above Lima Reservoir is 15 percent below last season. Stream-flow estimates are shown on the stream-flow forecast sheets. The northern portion of Soil Conservation District 76 should fair better, where the flow from the Big Hole River is expected to be 90 percent average.

MADISON RIVER BASIN:

The March first Snow Surveys indicate a water supply approximately 88 percent average, with the inflow to Hebgen Lake about 14 percent below average for the April-September period. The water supply to the Madison Soil Conservation District from the Madison and tributary creeks should be approximately 25 percent less than last season.

GALLATIN RIVER BASIN:

The water supply for irrigated land appears to be 92 percent normal for this season. Snow Survey measurements indicate a slightly heavier pack than last season by 3 percent. The Gallatin River at Gateway is expected to flow 409,000 acre feet between April 1 and September 30, as compared to the average of 445,000 acre feet.

MISSOURI RIVER - Toston to Fort Benton:

The 1958 snow-pack on the tributaries to this reach of the river is 93 percent average and about 15 percent below last season's pack. It is anticipated that the April-September flow into Canyon Ferry Reservoir will be 79 percent average or 2,014,000 acre feet. The water supply for irrigation from small streams through the Townsend and Helena Soil Conservation District should be less than 15 percent. This season, the snow-pack on the Sun River above Gibson Reservoir is 18 percent below last year. The first estimate of inflow to this reservoir for the April-September period is 516,000 acre feet, or 98 percent normal. Last season's flow for this period was 531,000 acre feet. The March first estimate of flow into Fort Peck for the April-September period is 3,769,000 acre feet or 86 percent of the 1938-52 average. The April-July flow is expected to be 3,266,000 acre feet.

YELLOWSTONE RIVER BASIN:

The 1958 snow-pack in Yellowstone National Park is 78 percent normal and 76 percent of last season's pack. Irrigation from small streams from the Absarokee range in the Big Timber-Columbus Soil Conservation District is expected to be about 92-95 percent average flow. The March first estimate of flow from Rock Creek near Red Lodge is 94 percent average or 101,000 acre feet. The Clark Fork of the Yellowstone River Basin at Chance is estimated to flow 91 percent average during April through September, which is about 10 percent less than last season.

COLUMBIA RIVER

FLATHEAD BASIN:

Water content, basin-wise, of the snow-pack is about the same as last season and is 106 percent average. The March first estimate of probable inflow to Hungry Horse Reservoir for the April-September period is 2,030,000 acre feet or 99 percent average. It is anticipated that the April-July flow will be 1,927,000 acre feet; the April-June flow will be about 1,727,000 acre feet. These figures are about 103 percent of last season's flow.

CLARK FORK BASIN:

The snow water content is 12 percent higher than last season and 103 percent average. This healthy condition will assure a GOOD water supply from this stream. The snow cover over the Bitterroot River Basin and tributary streams is slightly lower, but still 92 percent average. The Blackfoot River will probably flow 114 percent average, which is the highest estimate of the tributaries to the Clark Fork system.

MONTANA STREAM-FLOW FORECASTS MARCH 1, 1958

The following summarized runoff forecasts are based principally on mountain snow cover and on the assumption that precipitation and temperature during the forecast period will be near average. Appreciable deviations from normal of temperature and/or precipitation during the forecast period will correspondingly modify these forecasts.

UPPER MISSOURI RIVER IN MONTANA	Seasonal Stream-Flow in Thousands of Acre Feet					
	FORECAST RUNOFF	% 15-Yr. AVG.	FORE-CAST PERIOD	Measured Runoff 1956##	Measured Runoff 1955	1938-52 Average
RED ROCK RIVER						
Monida (near) (1)	678	83	Apr-Sept	60	71	81
	636	84	Apr-July	58	66	76
BEAVERHEAD RIVER						
Barrats (at)	143	81	Apr-Sept	155	119	177
	108	81	Apr-July	122	87	134
BIG HOLE RIVER						
Melrose (near)	675	90	Apr-Sept	842	592	745
	624	91	Apr-July	796	548	687
JEFFERSON RIVER						
Sappington (at)	945	89	Apr-Sept	1045	793	1057
	839	89	Apr-July	967	725	938
MADISON RIVER						
West Yellowstone (near)	174	88	Apr-Sept	255	183	198
	133	88	Apr-July	200	136	151
Grayling (near) (2)	362	86	Apr-Sept	488	345	420
(Net inflow to Hebgen Lk)	287	86	Apr-July	402	274	333
McAllister (near) (3)	633	87	Apr-Sept	802	593	726
	510	87	Apr-July	671	481	585
GALLATIN RIVER						
Gateway (near)	409	92	Apr-Sept	499	350	445
	352	92	Apr-July	442	296	384
Logan (at)	418	87	Apr-Sept	512	384	478
	358	87	Apr-July	452	336	410
Hyalite Cr. R.S. (at) (7)	36.5	104	Apr-Sept	29	34	35
	31.2	104	Apr-July	25	29	30
MISSOURI RIVER						
Toston (at) (3)	2014	79	Apr-Sept	2345	1730	2535*
	1704	78	Apr-July	2098	1549	2191*
Fort Benton (at) (4)	3003	89	Apr-Sept	3131	2986	3381
	2531	88	Apr-July	2722	2557	2874
Virgelle (at) (4)	3621	90	Apr-Sept	3261	3708	4013
(Loma)	3091	90	Apr-July	2806	3232	3445
Zortman (near) (4)	3861	89	Apr-Sept	3588	4264	4357
	3286	88	Apr-July	3076	3698	3726
Ft. Peck Dam (below) (5)	3769	86	Apr-Sept	3290	3743	4362
	3266	89	Apr-July	2613	3049	3666
Williston, N. D.	9348	80	Apr-Sept	9625	9533	11750
	7845	78	Apr-July	8053	8304	10228

(1) Observed flow plus change in Storage in Lima Reservoir
(2) Observed flow plus change in Storage in Hebgen Lake
(3) Observed flow plus change in Storage in Hebgen and Ennis Lakes
(4) Observed flow plus change in Storage in Canyon Ferry
(5) Observed flow plus change in Storage in Canyon Ferry and Ft. Peck Reservoirs
(7) Observed flow plus change in Storage in Hyalite Canyon
(*) Less than 15 years in 1938-52 period. Average for 15 yrs. nearest the base period.
(##) Preliminary data furnished by U. S. Geological Survey, subject to correction

MONTANA STREAM-FLOW FORECASTS MARCH 1, 1958

UPPER MISSOURI RIVER IN MONTANA	Seasonal Stream-Flow in Thousands of Acre Feet					
	FORECAST RUNOFF	% 15-Yr. AVG.	FORE-CAST	Measured Runoff 1956##	Measured Runoff 1955	1938-52 Average
SUN RIVER						
Net inflow to Gibson Reservoir	561	98	Apr-Sept	668	517	570*
	513	98	Apr-July	618	478	521*
MARIAS RIVER						
Shelby (near)	518	98	Apr-Sept	684	614	527
	476	99	Apr-July	617	561	482
JUDITH RIVER						
Utica (near)	27.3	68	Apr-Sept	18.4	29.2	39.8
	24.7	68	Apr-July	17.6	27.3	36.3
MUSSELSHELL RIVER						
Delpine (near)	6.0	88	Apr-Sept	4.8	3.6	6.8
	5.0	89	Apr-July	4.1	2.9	5.6
YELLOWSTONE RIVER						
Corwin Springs (at)	1608	86	Apr-Sept	2427	1527	1870
	1343	86	Apr-July	2099	1254	1556
Livingston (near)	1832	86	Apr-Sept	3219	1621	2134
	1513	85	Apr-July	2322	1298	1770
Billings (at)	3242	81	Apr-Sept	4788	2958	4025
	2784	81	Apr-July	4225	2549	3446
Miles City (at)	5047	79	Apr-Sept	6175	4381	6369
	4318	80	Apr-July	5324	3816	5421
Sidney (near)	5187	78	Apr-Sept	6114	4553	6648
	4494	78	Apr-July	5315	4082	5724
SHIELDS RIVER						
Wilsall (near)	27.7	69	Apr-Sept	36.4	29.2	40.1
	26.0	69	Apr-July	34.6	27.3	37.6
Clyde Park (at)	88	83	Apr-Sept	97.0	72.1	105.6
	82	84	Apr-July	94.2	67.0	98.0
ROSEBUD RIVER						
Absarokee (near) (8)	250	95	Apr-Sept	251.4	153.0	263.0
	201	95	Apr-July	207.6	124.5	211.9
STILLWATER RIVER						
Rosebud Cr. (above) (8)	306	92	Apr-Sept	359.9	243.1	330.8
	276	93	Apr-July	321.1	213.1	288.1
Absarokee (near) (8)	548	92	Apr-Sept	611.4	396.1	593.8
	461	92	Apr-July	528.7	337.6	500.0
ROCK CREEK						
Red Lodge (near)	101	94	Apr-Sept	134	71	107
	77	94	Apr-July	110	50	82
CLARK FORK RIVER						
Chance (at)	537	91	Apr-Sept	716	419	580
	481	93	Apr-July	660	386	517
Edgar (at)	576	93	Apr-Sept	773	422	614
	509	94	Apr-July	698	384	539

(##) Preliminary data furnished by U. S. Geological Survey, subject to correction

(*) Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.

(8) Observed flow plus change in Storage in Mystic Lake

MONTANA STREAM-FLOW FORECASTS MARCH 1, 1958

UPPER COLUMBIA RIVER IN MONTANA	Seasonal Stream-Flow in Thousands of Acre Feet					
	FORECAST RUNOFF	% 15-Yr. AVG.	FORE-CAST PERIOD	Measured Runoff 1956##	Measured Runoff 1955	1938-52 Average
CLARK FORK RIVER						
Bonner (above) (14)	714	92	Apr-Sept	880	739	771
	629	93	Apr-July	780	645	678
	524	90	Apr-June	695	428	583
Missoula (above)	1686	105	Apr-Sept	2012	1590	1602
	1505	105	Apr-July	1817	1386	1429
	1280	104	Apr-June	1622	994	1229
Missoula (below)	3082	104	Apr-Sept	3960	3094	2971
	2810	104	Apr-July	3654	2804	2700
	2462	105	Apr-June	3290	2070	2335
St. Regis (at)	4153	105	Apr-Sept	5749	4201	3951
	3767	105	Apr-July	5326	3775	3588
	3335	107	Apr-June	4817	2843	3112
Plains (near) (15)	10746	100	Apr-Sept	15138	11038	10747
	9812	100	Apr-July	14070	10018	9813
	8434	100	Apr-June	12531	7810	8434
Thompson Falls (at) (15)	11470	100	Apr-Sept	15920	11705	11479
	10492	100	Apr-July	14809	10678	10500
	9002	100	Apr-June	13188	8322	9009
Cabinet Gorge (at) (15)	12268	100	Apr-Sept	- -	- -	12211
	11238	100	Apr-July	- -	- -	11186
	9629	100	Apr-June	- -	- -	9584
BLACKFOOT RIVER						
Bonner (near)	972	114	Apr-Sept	1132	851	851
	876	114	Apr-July	1037	742	767
	756	114	Apr-June	927	566	663
BITTERROOT RIVER						
Darby (near)	494	94	Apr-Sept	740	540	525
	458	94	Apr-July	701	500	487
	400	93	Apr-June	649	394	429
At Mouth (16)	1282	94	Apr-Sept	1948	1504	1369
	1196	94	Apr-July	1837	1418	1270
	1056	96	Apr-June	1667	1075	1105

(14) Difference in observed flow, Clark Fork above Missoula & Blackfoot at Bonner
(15) Observed flow plus change in Storage in Flathead Lake & Hungry Horse Res.
(16) Difference in observed flow, Clark Fork above and below Missoula
(##) Preliminary data furnished by U. S. Geological Survey, subject to correction

MONTANA STREAM-FLOW FORECASTS MARCH 1, 1958

UPPER COLUMBIA RIVER IN MONTANA	Seasonal Stream-Flow in Thousands of Acre Feet					
	FORECAST RUNOFF	% 15-Yr. AVG.	FORE-CAST PERIOD	Measured Runoff 1956##	Measured Runoff 1955	1938-52 Average
FLATHEAD RIVER						
Columbia Falls (near)	1689	98	Apr-Sept	2308	1745	1729
(North Fork)	1538	98	Apr-July	2139	1576	1575
	1325	98	Apr-June	1864	1233	1350
Columbia Falls (at) (17)	5432	97	Apr-Sept	7164	5707	5619
	5064	97	Apr-July	6720	5268	5214
	4438	98	Apr-June	5959	4208	4530
Polson (near) (15)	6314	97	Apr-Sept	8603	6594	6612
	5873	95	Apr-July	8080	6111	6150
	5077	95	Apr-June	7137	4857	5317
MIDDLEFORK FLATHEAD RIVER						
West Glacier (near)	1588	96	Apr-Sept	2093	1682	1659*
	1470	95	Apr-July	1956	1551	1540*
	1241	93	Apr-June	1712	1224	1330*
SOUTH FORK FLATHEAD RIVER						
Columbia Falls (near) (17)	2030	99	Apr-Sept	2593	2085	2058
(Net inflow to Hungry	1927	99	Apr-July	2488	1977	1950
Horse Reservoir)	1727	99	Apr-June	2279	1630	1727
SWAN RIVER						
Big Fork (near)	697	119	Apr-Sept	750	570	584
	620	120	Apr-July	676	499	518
	516	121	Apr-June	581	518	427

(15) Observed flow plus change in Storage in Flathead Lake & Hungry Horse Res.
(17) Observed flow plus change in Storage in Hungry Horse Reservoir
(*) Less than 15 years in 1938-52 period. Average for 15 years nearest the base period
(##) Preliminary data furnished by U. S. Geological Survey subject to correction

COMPARISON OF SNOW COVER WITH THAT OF PREVIOUS YEARS

Summary of Snow Survey Data by Tributary Watersheds as of March 1, 1958

TRIBUTARY BASINS	No. of Courses Averaged	No. Years Used	1958 Snow Water Equivalent Expressed as Percent of		
			1957	1956	Average %
MISSOURI RIVER BASIN IN MONTANA					
JEFFERSON RIVER	25	5-15	94	69	84
Rock-Beaverhead	6	10-15	99	102	87
Horse Prairie	6	10	90	58	82
Big Hole	9	5-15	90	66	94
Wise River	3	10-15	102	64	86
Ruby River	1	13	150	80	93
MADISON RIVER	7	15	70	57	79
GALLATIN RIVER	4	15	103	78	99
MISSOURI MAIN STEM	10	15	120	81	93
Teton River	3	10	68	54	56
Sun River	7	9-15	82	61	67
Marias River	1	15	82	67	90
Milk River	1	15	48	78	57
Musselshell River	1	15	130	51	82
UPPER YELLOWSTONE (MONTANA)	8	11-15	76	49	78
COLUMBIA RIVER BASIN IN MONTANA					
KOOTENAI RIVER ABOVE LIBBY, MONTANA	11	7-15	80	67	82
FLATHEAD RIVER	19	7-15	102	85	95
UPPER CLARK FORK	19	5-15	112	77	103
BITTERROOT RIVER	5	7-15	96	66	92

MONTANA SNOW SURVEYS MARCH 1, 1958

MISSOURI BASIN DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENTS 1958 Date of Survey	1958 Snow Depth (In.)	1958 Water Content (In.)	Past Record Water Content (In.) 1957	1956	1938-52 Average	Prior Years of Record
JEFFERSON RIVER									
(Rock-Beaverhead)									
Lakeview Canyon	11E4	6930	2/28	35	7.7	9.7	7.8	10.3**	10
Lakeview Ridge	11E3	7400	2/28	30	7.3	8.0	6.9	8.4**	10
Limekiln	12E2	6950	2/11	8	1.8	0.7	1.1	1.2**	10
White Pine Ridge	12E1	8850	2/11	29	6.6	2.6	4.5	4.4**	10
#Camp Creek	12E3	6800	2/28	31	7.2	8.1	8.6	9.2	22
#Kilgore	11E12	6200	2/28	27	7.2	9.2	8.3	9.9	21
(Horse Prairie)									
Bloody Dick	13D10	7600	2/16	35	7.9	10.0	13.8	10.3**	10
Gold Stone	13D9	8100	2/16	41	10.0	12.0	18.0	13.1**	10
Lemhi Pass	13E1	7400	2/13	29	6.4	5.7	10.5	7.4**	10
Selway Junction	13D11	6800	2/12	26	5.4	7.0	10.4	7.2**	10
Terrell Creek	13D12	6650	2/12	19	4.3	4.0	6.4	4.3**	10
Trail Creek	13E2	7090	2/13	28	6.0	5.9	9.8	6.7**	10
(Big Hole)									
Big Hole Pass	13D3	7440	2/17	46	12.4	12.6	18.2	15.1**	10
Big Hole Pass (b1)	13D4	6900	2/17	42	10.9	11.6	16.2	13.0**	10
East Boundary	13D5	6700	2/17	25	5.8	6.0	8.4	7.1**	10
Gibbons Pass	13D2	7100	2/27	58	18.3	20.9	27.2	20.4	24
Jahnke Creek	13D8	7340	2/16	33	7.5	10.2	11.8	9.7**	10
Miner Forks	13D6	7300	2/15	35	8.2	10.3	14.8	10.7**	10
Miner Lake	13D7	6720	2/15	24	5.2	5.6	9.9	7.1**	13
#Moose Creek	13D16	6200	2/26	44	13.4	13.9	19.4	14.5	20
Storm Lake	13C7	7780	2/20	32	9.0	9.0	15.8	11.2**	5
(Wise River)									
Anderson Meadow	13D14	7000	2/18	25	5.6	5.3	9.3	7.4**	10
Elk Horn	13D15	8450	2/28	31	7.6	7.9	12.8	8.1	23
Wise River	13D13	6300	2/18	18	4.4	4.1	5.4	4.9**	10
(Ruby River)									
Flashlight	12D3	6950	2/20	14	3.6	2.4	4.5	3.9**	13

* Less than 15 years in 1938-52 period. Average for 15 years nearest the base period.
** Average for period of record.
# Adjacent Basin

MONTANA SNOW SURVEYS MARCH 1, 1958

MISSOURI BASIN DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	Date of Survey	SNOW COVER MEASUREMENTS 1958 Snow Depth (In.)	1958 Water Content (In.)	Past Record Water Content (In.) 1957	1956	1938-52 Average	Prior Years of Record
MADISON RIVER									
Hebgen	11E5	6550	2/27	35	9.1	12.3	13.5	11.2	24
Norris Basin	10E2	7500	2/28	29	7.9	9.1	12.5	8.6*	15
21-Mile	11E6	7150	2/28	40	11.5	17.5	22.9	14.7	24
W. Yellowstone	11E7	6700	2/27	28	6.5	11.8	14.8	10.4	24
#Big Springs	11E9	6500	2/26	49	14.4	22.0	23.8	18.3	22
#Island Park	11E10	3600	2/27	42	11.8	15.4	19.8	14.6	22
#Valley View	11E8	6500	2/26	38	9.2	13.6	17.1	13.3**	13
GALLATIN RIVER									
Devil's Slide	10D4	8100	3/1	59	17.2	14.2	18.6	16.0	23
Hood Meadow	10D3	6600	3/2	36	8.6	6.2	7.6	7.1	23
Mystic Lake	10D2	6600	Est.	25	6.2	-	-	-	-
New World	10D1	6700	2/28	39	8.5	5.6	10.0	8.6*	16
21-Mile	11E6	7150	2/28	40	11.5	17.5	22.9	14.7	21
MISSOURI RIVER MAIN STEM									
Chessman Res.	12C5	6200	2/28	11	1.9	2.1	5.4	4.3	22
Crystal Lake	9C1	6100	2/28	61	9.7	7.6	10.2	10.2*	17
Grasshopper	10C2	7000	2/28	16	3.5	2.7	6.9	4.3	20
King's Hill	10C1	7950	2/28	57	11.2	10.0	9.6	11.3	24
Picnic Grounds	13C6	6500	2/28	21	4.0	3.9	5.6	4.3**	13
Pipestone Pass	12D1	7200	2/28	19	3.7	3.6	5.9	4.2	20
Stemple Pass	12C1	6900	2/27	35	8.9	8.1	10.4	8.4	24
Tenmile, Lower	12C2	6250	3/2	20	4.9	4.9	7.5	5.9	23
Tenmile, Middle	12C3	6800	3/1	35	8.3	6.8	7.5	8.6	24
Tenmile, Upper	12C4	8000	3/1	44	11.2	9.9	14.0	11.2	23
(Teton River)									
Fright Creek	12A1	6000	2/24	32	9.5	13.8	15.7	15.6**	10
Waldron Creek	12B2	5600	2/24	16	3.6	5.4	8.0	6.9**	10
West Fork	12B1	6000	2/24	25	7.8	11.8	14.7	14.9**	10
(Sun River)									
Benchmark	12B8	5500	2/26	20	4.6	5.8	6.5	9.0**	9
Cabin Creek	12B6	5400	2/27	18	4.5	5.8	8.1	6.8**	9
5-Bull	12B9	5600	2/26	14	3.1	4.2	--	7.0**	9
Gates Park	12B5	5300	2/28	28	7.6	8.8	11.7	10.1**	9
Goat Mountain	12B7	7000	2/25	26	6.6	9.4	13.2	8.8	24
Wrong Creek	12B4	5700	4/1	39	12.3	13.0	16.2	15.1**	9
Wrong Ridge	12B3	6800	4/2	48	15.2	18.6	25.5	21.2**	9

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** Average for period of record.
\# Adjacent Basin
E Estimated

MONTANA SNOW SURVEYS MARCH 1, 1958

MISSOURI BASIN DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	Date of Survey	SNOW COVER MEASUREMENTS 1958 Snow Depth (In.)	1958 Water Content (In.)	Past Record Water Content (In.) 1957	1956	1938-52 Average	Prior Years of Record
MISSOURI RIVER MAIN STEM (Cont'd)									
(Marias River)									
Marias Pass	13A5	5250	2/27	42	14.0	17.2	20.8	15.6	24
(Milk River)									
Rocky Boy	9A1	5250	3/3	14	2.8	5.8	3.6	4.9*	17
(Musselshell)									
Grasshopper	10C2	7000	2/28	16	3.5	2.7	6.9	4.3	20
UPPER YELLOWSTONE									
Camp Senia	9D1	7890	2/27	19	4.3	3.1	6.3	4.7**	13
Canyon	10E3	7750	2/28	42	10.3	14.8	18.7	10.7**	19
Cooke City	10D7	7400	2/27	25	4.6	7.7	9.6	7.0	21
Crevice Mt.	10D5	8400	2/28	22	5.3	5.3	7.9	8.3*	19
Lake Camp #1	10E4	7850	2/28	34	7.0	7.4	17.5	8.8*	18
Lake Camp #2		7850	2/28	29	5.9	-	-	-	-
Lodgepole, Wyo.	9E1	8200	3/2	27	6.8	9.2	14.2	- -	2
Lupine	10E1	7300	2/27	24	5.6	9.8	13.4	8.9*	18
#Astor Creek	10E8	7700	2/27	69	21.8	29.8	44.5	24.5	39
#Thumb Divide	10E7	7900	2/27	52	15.3	19.8	33.1	21.9**	11
(Shields River)									
Porcupine	10C3	6500	2/28	27	4.5	4.8	7.6	5.2	15

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** Average for period of record.
# Adjacent Basin

MONTANA SNOW SURVEYS MARCH 1, 1958

COLUMBIA BASIN DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENTS 1958 Date of Survey	1958 Snow Depth (In.)	1958 Water Content (In.)	Past Record Water Content (In.) 1957	1956	1938-52 Average	Prior Years of Record
KOOTENAI RIVER (above Libby, Montana)									
Blue Bird Basin	14A1	6800	Est.	75	27.5	-	-	-	-
Brush Creek	14A4	5000	2/27	42	11.7	11.4	15.6	13.0**	11
Fernie	Can	3500	2/28	21	6.7	8.4	13.2	8.1*	18
Ferguson	Can	3000				17.2	22.3	19.2**	6
Gray Creek	Can	5100	2/27	40	12.6	17.7	17.0	17.2**	9
Kimberley	Can	3800	2/28	17	5.2	7.1	11.8	6.8*	17
Marble Canyon	Can	5000	3/1	39	11.2	15.5	13.1	14.2**	11
Nelson	Can	3050	2/28	41	14.6	15.7	21.8	14.0*	18
New Fernie	Can	4100	2/28	36	12.3	13.8	9.8	14.2**	7
Old Glory	Can	7000	2/28	82	25.7	-	-	-	-
Red Mountain	15A1	6000	2/24	41	13.4	17.0	22.0	15.6	21
Sinclair Pass	Can	4500	3/1	13	3.6	6.1	6.5	6.1**	10
Sullivan Mine	Can	5100	2/27	39	10.6	12.3	17.5	13.4**	12
Upper Elk River	Can	4400	2/27	17	5.3	9.4	13.6	8.8**	10
Weasel Divide	14A7	5450	2/25	70	25.3	-	-	-	-
FLATHEAD RIVER									
Basin Creek	13B14	5000	3/1	27	8.4	5.7	10.6	8.8**	7
Big Creek	13B3	6750	2/27	121	42.9	34.7	42.7	33.5*	17
Blue Bird Basin	14A1	6800	Est.	75	27.5	-	-	-	-
Brush Creek	14A4	5000	2/27	42	11.7	11.4	15.6	13.0**	11
Cattle Queen	13A1	4700	2/27	85	26.1	25.6	32.2	30.0**	13
Coyote Hill	13B10	4200	2/28	33	5.9	9.4	11.2	9.9**	11
Desert Mountain	13A2	5600	2/28	44	12.4	13.5	18.2	13.1**	14
Goat Mountain	12B7	7000	2/25	26	6.6	9.4	13.2	8.8	24
Hell Roaring Div.	14A3	5700	2/26	81	23.3	27.1	27.2	27.8**	8
Holbrook	13B13	4530	3/1	30	9.0	6.7	10.6	9.5**	7
Kishenehn	14A2	4300	3/3	27	8.0	10.0	8.1	10.4**	13
Logan Creek	14A5	4300	2/27	34	8.5	8.8	11.6	8.9**	11
Marias Pass	13A5	5250	2/27	42	14.0	17.2	20.8	15.6	24
Mineral Creek	13A16	4500	2/28	57	16.9	18.3	-	-	-1
N. Fork Jocko	13B7	6330	2/28	123	43.4	35.6	43.9	36.0	17
Spotted Bear Mt.	13B2	7000	3/3	35	11.3	12.0	15.0	14.8**	10
Strawberry Lake	13A10	6500	2/28	112	32.9	33.7	36.0	35.7**	7
Trinkus Lake	13B1	6500	3/4	110	37.5	30.8	37.5	35.4**	8
Trout Lake	13A12	3600	3/2	51	13.0	14.1	15.0	16.4**	10
Twin Creeks	13B11	3580	3/2	39	10.8	10.3	11.1	11.0**	7
Upper Holland	13B5	7000	2/27	84	23.6	27.2	32.5	31.0**	8
Weasel Divide	14A7	5450	2/25	70	25.3	-	-	-	-

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** Average for period of record.

MONTANA SNOW SURVEYS MARCH 1, 1958

COLUMBIA BASIN DRAINAGE BASIN AND SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENTS 1958 Date of Survey	1958 Snow Depth (In.)	1958 Water Content (In.)	Past Record Water Content (In.) 1957	1956	1938-52 Average	Prior Years of Record
CLARK FORK									
Coyote Hill	13B10	4200	2/28	33	5.9	9.4	11.2	9.9**	11
Chessman Res.	12C5	6200	2/28	11	1.9	2.1	5.4	4.3	22
East Fork R.S.	13D1	5400	2/24	24	6.5	5.8	8.7	5.4**	7
Eldorado Mine	13C9	7800	2/22	47	13.6	13.1	20.7	16.1**	5
Fish Lake, Ida.	21B4	5000	3/1	93	35.2	33.6	- -	36.0**	5
Fred Burr Pass	13C11	8000	2/21	59	19.0	16.9	- -	- -	1
Gold Creek Lake	13C10	7200	2/22	39	11.0	10.6	16.2	13.3**	5
Hoodoo Creek	15C1	6200				59.6	- -	50.0**	5
Intergaard	13C4	6450	2/28	31	6.8	6.5	8.0	6.1	22
Lubrecht For. #6	13C8	5400	2/28	19	4.1	3.1	6.2	4.3**	7
N. Fork Jocko	13B7	6330	2/28	123	43.4	35.6	43.9	36.0*	17
Picnic Grounds	12C6	6500	2/28	21	4.0	3.9	5.6	4.4*	13
Pipestone Pass	12D1	7200	2/28	19	3.7	3.6	5.9	4.2	20
Red Lion	13C12	7000	2/21	44	12.2	-	-	-	-
Slide Rock Mt.	13C2	7100	3/4	39	9.9	9.7	- -	- -	3
Southern Cross	13C5	6500	2/28	25	5.6	5.8	6.0	4.6	22
Stemple Pass	12C1	6900	2/27	35	8.9	3.6	5.9	4.2	22
Storm Lake	13C7	7780	2/20	32	9.0	9.0	15.8	11.2**	5
Stuart Mill	13C6	6500	2/28	26	5.5	5.4	6.6	5.2	22
Stuart Mt. #1	13C1	7400	3/2	88	29.4	27.2	- -	24.4	15
Tenmile, Lower	12C2	6250	3/2	20	4.9	4.9	7.5	5.9	23
Tenmile, Middle	12C3	6800	3/1	35	8.3	6.8	7.5	8.6	24
Tenmile, Upper	12C4	8000	3/1	44	11.2	9.9	14.0	11.2	23
Thisted Ranch	14B2	3500	3/1	23	7.6	-	-	New	-
TV Mountain	14B1	6800	2/26	51	14.4	13.6	20.7	- -	2
#49 Meadows	15B3	5000	2/28	86	32.4	27.8	39.0	30.3*	18
#Lookout	15B2	5250	2/28	89	33.6	30.3	51.6	30.7	33
BITTERROOT									
East Fork R.S.	13D1	5400	2/24	24	6.5	5.8	8.7	5.4**	7
Gibbons Pass	13D2	7100	2/27	58	18.3	20.9	27.2	20.4	24
Nezperce Camp	14D2	5580	2/25	41	12.7	11.4	18.9	11.2*	18
Nezperce Pass	14D1	6575	2/25	34	11.0	12.4	19.8	15.2*	19
Packers Meadow	14C2	5700	2/26	59	21.2	21.1	- -	18.2**	14
Stuart Mt. #1	13C1	7400	3/2	88	29.4	27.2	- -	24.4	15
#Lolo Pass	14C5	5230	2/26	78	28.5	29.1	30.0	- -	2
#Moose Creek	13D16	6200	2/27	44	13.4	13.9	19.4	14.8*	20
#Powell R.S.	14C6	4230	2/27	37	12.7	14.3	- -	- -	1

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** Average for period of record.
\# Adjacent Basin

STATUS OF RESERVOIR STORAGE
MISSOURI RIVER IN MONTANA
March, 1958

BASIN & STREAM	RESERVOIR	USABLE CAPACITY 1000 A.F.	USABLE STORAGE - 1000 ACRE FEET 1958	1957	1956	1938-52 AVG.	YRS.
MISSOURI RIVER BASIN							
Beaverhead	Lima	84.0	26.4	6.4	19.9	64.5*	16
Madison River	Hebgen Lake	345.0	157.4	158.1	185.2	234.7	22
Madison River	Ennis Lake	41.0	38.8	38.4	32.5	34.1	22
Hyalite Creek	Middle Creek	8.0	3.7	3.1	3.4	3.6**	6
Missouri River	Canyon Ferry	2043.0	1575.0	1488.0	1526.0	1272.0**	5
Missouri River	Hauser Lake & Lake Helena	62.5	59.0	62.5	65.6	46.2*	18
Missouri River	Lake Helena	10.4	9.2	10.4	11.6	7.7**	10
Missouri River	Holter Lake	81.9	76.7	78.8	44.2	53.3	22
N.Fk. Sun River	Gibson	105.0	29.0	39.6	70.7	59.6	22
N.Fk. Sun River	Willow Creek	32.3	17.8	23.4	26.7	12.9	22
N.Fk. Sun River	Pishkun	32.0	18.2	16.4	16.6	15.6	22
Marias River	Tiber	1316.0	625.2	628.0	37.3	--	2
Birch Creek	Swift	30.0		23.7	22.7	19.5	22
Dupuyer & Birch	Lake Francis	112.0		89.9	92.4	72.8	22
Judith River	Ackley Lake	5.8		--	4.2	4.2*	18
Missouri River	Ft. Peck 3/	19410.0	7748.0	5397.0	4729.0	10078.0*	17
Milk River	Fresno	127.2	55.9	75.1	66.6	56.2	18
Milk River	Nelson	66.8	49.8	51.4	39.9	28.5	22
W. Rosebud Cr.	Mystic Lake	20.8	7.4	6.0	6.2	8.0	22
Tongue River	Tongue River	73.9	9.0	10.8	27.0	9.9*	17
Swiftcurrent Cr.	Sherburne Lake	66.1	21.0	18.2	20.7	18.9	22
MISSOURI RIVER BASIN - WYOMING							
Shoshone River	Buffalo Bill	440.0	161.9	128.2	122.1	264.5	23
Wind River	Boysen	408.6	249.1	220.0	13.1	262.2**	6
Wind River	Pilot Butte	31.6	15.9	14.3	14.6	14.5	22
Bull Creek	Bull Lake	152.0	66.5	67.8	62.3	56.7*	19
Belle Fourche	Key Hole	190.0	1.9	14.1	20.9	12.1**	5
MISSOURI RIVER BASIN - NORTH DAKOTA							
Heart River	Heart Butte	54.8	55.3	43.7	45.0	53.1**	8
Heart River	Dickerson	4.3	4.2	3.2	2.6	3.7**	7
Missouri River	Garrison Lk.	13805.0	4448.0	535.2	853.0	--	3
MISSOURI RIVER BASIN - SOUTH DAKOTA							
Belle Fourche	Belle Fourche	185.0		37.0	78.2	--	3
Cheyenne River	Angostura	160.0		27.8	74.9	--	2
Cheyenne River	Deerfield	15.1	11.3	8.8	10.5	--	4
Grand River	Shadehill	84.0	79.4	133.4	128.1	134.4**	5
Missouri River	Ft. Randall	2401.6		1090.7	1453.8	--	4

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** Average for period of record
3/ Gross contents

STATUS OF RESERVOIR STORAGE
COLUMBIA RIVER IN MONTANA
March, 1958

BASIN & STREAM	RESERVOIR	USABLE CAPACITY 1000 A.F.	USABLE STORAGE - 1000 ACRE FEET 1958	1957	1956	1938-52 AVG.	YRS.
COLUMBIA RIVER BASIN							
Flint Creek	Georgetown Lk.	31.0	19.9	19.2	21.7	22.9*	17
S.Fk. Flathead	Hungry Horse	3500.0	2088.0	1802.0	2595.0	1544.7**	6
Flathead River	Flathead Lake	1791.0	872.6	849.8	858.2	679.2	50
Flathead River 6/	Camas Res.	42.8	26.1	29.9	34.3	21.1*	17
Flathead River 7/	Mission Valley	98.6	19.7	28.5	27.2	36.8*	17

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** Average for period of record

6/ Camas Reservoirs are shown as a sum of (4) small reservoirs on the west side of Flathead Lake located on Dry Creek and Little Bitterroot River

7/ Mission Valley Reservoirs are shown as a sum of (8) small reservoirs located south and east of Flathead Lake. Both Camas and Mission Valley reservoirs are operated by the Indian Irrigation Service.

Federal - State - Private

COOPERATIVE SNOW SURVEYS

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Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation, navigation, mining and industry

"WATER IS THE WEST'S GREATEST RESOURCE"